FOREST SURVEY HANDBOOK

CHAPTER 20 - SUBJECT-MATTER STANDARDS AND STATISTICAL TABLES

Contents

FOREST SURVEY HANDBOOK

24	TIMBER GROWTH AND TIMBER REMOVALS
24.1	Annual Net Growth and Removals of Growing Stock, by Species
24.2	Annual Net Growth and Removals of Growing Stock, by Ownership Classes
24.3	Annual Net Growth and Removals of Sawtimber, by Species
24.4	Annual Net Growth and Removals of Sawtimber, by Ownership Classes
25	TIMBER MORTALITY ON COMMERCIAL FOREST LAND
25.1	Growing Stock and Sawtimber Mortality, by Species
25.2	Growing Stock and Sawtimber Mortality, by Ownership Classes
25.3	Growing Stock and Sawtimber Mortality, by Causes
26	TIMBER PRODUCT OUTPUT
26.1	Timber Products Output, by Products and Source of Material
26.2	Roundwood Products Output by Products and Source
26.3	Growing Stock Timber Removals by Items
26.4	Sawtimber Removals by Items
26.5	Unused Residues Volume by Industry and Type of Residue
27	PROJECTED TIMBER GROWTH AND CUT
28	FOREST TYPE MAPS
28.1	Cover Type Groups
28.11	Eastern
28.12	Western

FOREST SURVEY HANDBOOK

CHAPTER 20 - SUBJECT MATTER STANDARDS AND STATISTICAL TABLES

This chapter describes the required items for the inventory phase of the Forest Survey. It also includes the formats for statistical tables required as part of all State statistical reports.

Detailed procedures for collecting and processing the data to complete the required statistical tables are covered in chapters 40 and 50. Optional tables and items in standard tables may be included as desired by the Stations and Regions.

The use of --xxx.x in the tables in this chapter indicates that entries should be recorded in the units specified to one decimal place. For example, if the specified reporting unit for an area table was "thousand acres" (--xxx.x) and the actual acreage for a particular item was 150,730 acres it should be shown as 150.7 in the table.

In addition to the 28 tables shown in this chapter, input data for the stand projection program are required for each State. Detailed instructions for preparation of this input are included in chapter 60.

All the following items should be included in State and Regional reports. Exceptions must have Washington Office approval.

21 - LAND AREA

21.1 -- Land Area Classes. In preparing table 1, data on total area by States and counties published by the Bureau of the Census in its series GS-20 reports should be used, except where prior Washington Office approval has been obtained to use General Land Office area data.

Total land area should be adjusted for changes which have occurred since issuance of official census figures. These changes include creation of water bodies or land areas exceeding 40 acres in area, such as reservoirs or land reclaimed from water area.

Since the Forest Survey minimum areas for land classification differ from Bureau of the Census minimums, the Survey ordinarily classifies as water some areas which the Bureau of the Census includes in its total land area figure. Such areas of water less than 40 acres in extent shall be classified by the Survey as other land and footnoted, as indicated in table 1.

FOREST SURVEY HANDBOOK

Table 1.-- Area by land classes, (State), 19__

Land class	Thousand acres
	(--xxx.x)
Forest land:	
Commercial	
Productive reserved	
Unproductive	
Total	
Nonforest land:	
Cropland[1/]	
Pasture and range	
Other[2/]	
Total	
Total area[3/]	

1/ Source: 19__ Census of Agriculture.

2/ Includes swampland, industrial and urban areas, other nonforest land, and _____ acres, classed as water by Forest Survey standards, but defined by the Bureau of the Census as land.

3/ Source: United States Bureau of the Census, Land and Water Area of the United States, 19__.

FOREST SURVEY HANDBOOK

21.2 - Commercial Forest Land, by Ownership Classes. In preparing table 2 if any of the public ownership classes besides National Forest include significant acreages and detailed information is available, show the same information in State reports for these ownerships as required for National Forest.

Forest Survey figures on farmer-owned commercial forest land will differ from the Bureau of the Census figure of woodland on farms for a number of reasons. Forest Survey farmer-owned lands exclude lands leased by farm owners from nonfarmer owners. Census figures include noncommercial forest land and certain Indian lands. Census figures exclude certain farmer-owned forest lands held for nonagricultural purposes and unusually large tracts of forest land in farms.

Lands owned by retired farmers or wives of farmers should be classed as farmer-owned.

In cases where an owner qualifies as both a farmer and an operator of a wood-using plant, or is also a member of another occupational group included with miscellaneous private owners, the ownership should be classed as forest industry if the wood-using operation is of significant commercial importance. (Very small farm sawmills producing lumber only for home use, or mills producing less than 100 M annually, would not be considered of commercial importance.) Otherwise the holding shall be classed as farmer-owned. Under this classification system it is recognized that lands may be classed as forest industry or farmer-owned even though the owner derives most of his income from other sources.

Further classification by ownership size classes--specifically less than 50 acres, 50 to 100 acres, 100 to 500 acres, 500 to 2,500 acres, 2,500 to 5,000 acres, 5,000 to 50,000 acres, and 50,000 acres or more is optional but highly desirable. All tracts held by an owner in the United States should be included in determining size class, although other classifications based on acreages owned in a specified State; for example, also may be used.

Table 2.-- Area of commercial forest land, by ownership classes, (State), 19__

Ownership class	Thousand acres
	(--xxx.x)
National Forest	
Other Federal:	
Bureau of Land Management	
Indian	
Miscellaneous Federal	
Total other Federal	
State	
County and municipal	
Forest industry[1/]	
Farmer-owned	
Miscellaneous private:	
Individual	
Corporate	
Total miscellaneous private	
All ownerships	

1/ Not including _____ thousand acres of farmer-owned and miscellaneous private lands leased to forest industry.

21.3 - Commercial Forest Land, by Stand-Size and Ownership Classes

Table 3.-- Area of commercial forest land, by stand-size and ownership classes, (State), 19__

(Thousand acres)

Stand-size class	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)
Sawtimber stands[1/]					
Old-growth					
Young-growth					
Total					
Poletimber stands					
Sapling and seedling stands					
Nonstocked areas					
All classes					

1/ Breakdown by old and young growth required only in the West.

FOREST SURVEY HANDBOOK

21.4 - Commercial Forest Land, by Stand-Volume and Ownership Classes. Information in table 4 will permit direct comparisons with older Survey statistics for sawtimber stands classified on the basis of minimum net volumes of 1,500 or 5,000 board feet per acre.

Table 4.-- Area of commercial forest land, by stand-volume and ownership classes, (State), 19__

(Thousand acres)

Stand volume per acre 1/	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)
Less than 1,500 board feet					
1,500 to 5,000 board feet					
More than 5,000 board feet 2/					
All classes					

1/ International 1/4-inch rule.

2/ Use additional classes where appropriate.

FOREST SURVEY HANDBOOK

21.5 - Commercial Forest Land, by Stocking Classes Based on Selected Stand Components. Stocking is a measure of the extent to which the growth potential for the site is utilized by trees or pre-empted by other vegetative cover. Stocking is measured by comparison of basal area and/or number of trees, by age or size and spacing, with specified standards. Basal area per acre provides a measure of stocking for stands with trees 5.0 inches d.b.h. and larger, and numbers of trees per acre for stands with only trees less than 5.0 inches d.b.h.

Basal area standards for the species or types in a Station's area should be based on the best sources of information available, such as normal yield tables or thinning and spacing studies. These standards will be set so that 100 percent is the minimum level of stocking required to make full use of the site. This is the point at which further increases in density would result in no increase in net growth per acre. With the use of normal yield table data, 60 percent of normal is generally considered the minimum level of stocking required to make full use of the site. Stands will be considered overstocked if stocking is 133 percent or more, when 100 percent represents the minimum level of stocking required to make full use of the site.

A cumulative stocking table showing the data in table 5 is desirable but optional.

FOREST SURVEY HANDBOOK

Table 5.-- Area of commercial forest land, by stocking classes based on selected stand components, (State), 19__

(Thousand acres)

Stocking percentage	Stocking classified in terms of					
	All trees	Growing-stock trees			Rough and rotten trees	Inhibiting vegetation
		Total	Desirable	Acceptable		
	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)
160						
150 to 160						
140 to 150						
130 to 140						
120 to 130						
110 to 120						
100 to 110						
90 to 100						
80 to 90						
70 to 80						
60 to 70						
50 to 60						
40 to 50						
30 to 40						
20 to 30						
10 to 20						
Less than 10						
Total						

FOREST SURVEY HANDBOOK

21.6 - Commercial Forest Land, by Area Condition and Ownership Classes. In table 6, breakdowns of area condition classes, such as by site, age, and type, may be shown at the option of Stations and Regions.

For purposes of determining area condition class the following stocking classes are used:

1. Overstocked--133 percent or more stocking.

2. Full stocking--100 to 133 percent stocking.

3. Medium stocking--60 to 100 percent stocking.

4. Poor stocking--16.7 to 60 percent stocking.

5. Nonstocked--Less than 16.7 percent stocking.

Specific criteria for high- and low-risk old-growth stands should be included in western Station and Regional supplements to this section of the handbook. Low-risk stands generally include the relatively thrifty old-growth stands that are still increasing in net volume. High-risk old-growth stands generally have a negative net growth. Subclasses of these two classes might be used to show a "storage stands" category in contrast to "stands in need of salvage cutting to control mortality."

FOREST SURVEY HANDBOOK

Table 6.-- Area of commercial forest land, by area condition and ownership classes, (State), 19__

(Thousand acres)

Area condition class	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)
Class 10 Areas fully stocked with desirable trees and not overstocked.					
Class 20 Areas fully stocked with desirable trees, but overstocked with all live trees.					
Class 30 Areas medium to fully stocked with desirable trees, and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.					
Class 40 Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.					
Class 50 Areas poorly stocked with desirable trees, but fully stocked with growing stock trees.					
Class 60 Areas poorly stocked with desirable trees, but with medium to full stocking of growing stock trees.					
Class 70 Areas poorly stocked with desirable trees, and poorly stocked with growing stock trees.					
Class 80 (West only) Low-risk old-growth stands.					
Class 90 (West only) High-risk old-growth stands.					
All classes					

21.7 - Commercial Forest Land, by Site and Ownership Classes. Classification of forest land is based on culmination of mean annual increment of fully stocked natural stands. Yields may be substantially higher under intensive management.

Table 7.-- Area of commercial forest land, by site and ownership classes, (State), 19__

(Thousand acres)

Site class	All ownerships	National Forest	Other public	Forest industry	Farmer and miscellaneous private
	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)
165 cu.ft. or more					
120 to 165 cu.ft.					
85 to 120 cu.ft.					
50 to 85 cu.ft.					
Less than 50 cu.ft.					
All classes					

FOREST SURVEY HANDBOOK

21.8 - Commercial Forest Land, by Forest Types and Ownership Classes. Forest types shall be determined on the basis of species plurality of all live trees that contribute to no more than 16 percent stocking at a plot point. Mixtures of softwoods and hardwoods shall be designated as hardwood types when the hardwoods in combination represent a majority of stocking.

In addition to the major forest types shown below, significant local types grouped under these major types may be shown in table 6 at the option of Stations and Regions.

Eastern type groups	Western type groups
White-red-jack pine	Douglas-fir
Spruce-fir	Hemlock-Sitka spruce
Longleaf-slash pine	Redwood
Loblolly-shortleaf pine	Ponderosa pine
Oak-pine	Western white pine
Oak-hickory	Lodgepole pine
Oak-gum-cypress	Larch
Elm-ash-cottonwood	Fir-spruce
Maple-beech-birch	Hardwoods
Aspen-birch	Nonstocked
Nonstocked	

Table 8.-- Area of commercial forest land, by forest types and ownership classes, (State), 19__

(Thousand acres)

Forest type	All ownerships	Public ownerships	Private ownerships
(Show applicable type groups, as listed above.)	(--xxx.x)	(--xxx.x)	(--xxx.x)
All types			

21.9 - Noncommercial Forest Land, by Forest Types. It is recognized that commercial forest lands, both public and private, may be used for purposes other than timber production, but unless reserved by specific regulation or devoted exclusively to Christmas tree production, such lands should be classed as commercial forest land. In addition to the types specified in the table, other locally significant types may be shown at the option of Stations and Regions.

Table 9.-- Area of noncommercial forest land, by forest types, (State), 19__

(Thousand acres)

Type	All areas	Productive reserved areas	Unproductive areas
	(--xxx.x)	(--xxx.x)	(--xxx.x)
Forest types:			
(Show applicable type groups listed in section 21.8.)			
Total			
Noncommercial types:			
Chaparral			
Pinyon-juniper			
Other			
Total			
All types			

FOREST SURVEY HANDBOOK

22 - STAND TABLES - GROWING STOCK ON COMMERCIAL FOREST LAND. Number of trees by diameter class is to be shown in table 10 for the appropriate species listed below. This is a minimum list of species for national compilations. Stations and Regions may show additional species of local importance.

Eastern species	Western species
Longleaf and slash pines	Douglas-fir
Shortleaf and loblolly pine	Ponderosa and Jeffrey pine
Other yellow pines	True firs
Eastern white and red pine	Western hemlock
Jack pine	Sugar pine
Spruce and balsam fir	Western white pine
Eastern hemlock	Redwood
Cypress	Sitka spruce
Other eastern softwoods	Engelmann and other spruces
Select white oaks 1/	Western larch
Select red oaks 2/	Western redcedar
Other white oaks	Incense-cedar
Other red oaks	Lodgepole pine
Hickory	Other western softwoods
Yellow birch	Cottonwood and aspen
Hard maple	Red alder
Soft maple	Oak
Beech	Other western hardwoods
Sweetgum	
Tupelo and blackgum	
Ash	
Cottonwood and aspen	
Basswood	
Yellow-poplar	
Black walnut	
Other eastern hardwoods	

1/ (Q. alba, Q. michauxii, Q. muehlenbergii, Q. durandii, Q. bicolor, and Q. macrocarpa).

2/ (Q. rubra, Q. falcata var. pagodaefolia, and Q. shumardii).

Table 10.-- Number of growing stock trees on commercial forest land, by species and diameter classes, (State), 19__

(Thousand trees)

Species	Diameter class (Inches at breast height)										
	All classes	5.0-7.0	7.0-9.0	9.0-11.0	11.0-13.0	13.0-15.0	15.0-17.0	17.0-19.0	19.0-21.0	21.0-29.0	29.0 and larger
Softwoods:											
(Show applicable species as listed above.)											
Total											
Hardwoods:											
(Show applicable species as listed above.)											
Total											
All species											

FOREST SURVEY HANDBOOK

23 - TIMBER VOLUME ON COMMERCIAL FOREST LAND.

Volume estimates should include the volume of sound wood only. Include breakage as part of logging residues. Gross volumes may be estimated at the option of the Stations and Regions.

Estimates of timber volumes on productive forest land reserved from commercial timber use ordinarily will not be compiled. Permission of appropriate officials shall be obtained prior to publication of volume data for reserved areas.

Estimates of additional volumes on unproductive forest land are desirable, but optional.

23.1 - Timber Net Volume, by Timber Class

Table 11.--Net volume of timber on commercial forest land, by class of timber, and softwoods and hardwoods (State), 19__

(Million cubic feet)

Class of timber	All species	Softwoods	Hardwoods
	(--xxx.x)	(--xxx.x)	(--xxx.x)
Sawtimber trees:			
Saw-log portion			
Upper-stem portion			
Total			
Poletimber trees			
All growing-stock trees			
Rough trees			
Rotten trees			
Salvable dead trees			
Total, all timber			

23.2 - Growing Stock and Sawtimber Net Volume, by Ownership Class. In view of the local use of log rules other than the International 1/4-inch rule, Forest Survey reports should include conversion factors relating International 1/4-inch rule to Scribner or other appropriate rules. Volume statistics in terms of locally important rules in addition to the International 1/4-inch rule may be reported at the option of Stations and Regions.

Table 12.--Net volume of growing stock and sawtimber on commercial forest land, by ownership classes, and softwoods and hardwoods, (State), 19__.

Ownership class	Growing stock (Million cubic feet)			Sawtimber (Million board feet) 1/		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)
National Forest						
Other public						
Forest industry						
Farmer and miscellaneous private						
All ownerships						

1/ International 1/4-inch rule.

23.3 - Growing Stock Net Volume, by Species and Diameter Classes. See section 22.1 for species list. Add other locally important species.

Table 13.--Net volume of growing stock on commercial forest land, by species and diameter classes, (State), 19__

(Million cubic feet)

Species	Diameter class (Inches at breast height)										
	All classes	5.0-7.0	7.0-9.0	9.0-11.0	11.0-13.0	13.0-15.0	15.0-17.0	17.0-19.0	19.0-21.0	21.0-29.0	29.0 and larger
	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)
Softwoods:											
(List species)											
Total											
Hardwoods:											
(List species)											
Total											
Total all species											

23.4 - Sawtimber Net Volume, by Species and Diameter Classes. See section 22.1 for species list. Add other locally important species.

Table 14.--Net volume of sawtimber on commercial forest land, by species and diameter classes, (State), 19__

(Million board feet)[1/]

Species	Diameter class (Inches at breast height)								
	All classes	9.0-11.0[2/]	11.0-13.0	13.0-15.0	15.0-17.0	17.0-19.0	19.0-21.0	21.0-29.0	29.0 and larger
	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)	(--xxx.x)
Softwoods:									
(List species)									
Total									
Hardwoods:									
(List species)									
Total									
Total all species									

1/ International 1/4-inch rule.

2/ Softwoods only in States other than California, Oregon, Washington, and coastal Alaska.

FOREST SURVEY HANDBOOK

23.5 - Sawtimber Net Volume, by Species and Quality Classes. Since crews will only grade the first saw log in each live sawtimber tree, volumes by log grade for entire trees must be estimated by applying the results of special studies that relate the grade of the butt log to the grades of the remaining saw log portions. Special log grade study procedures should be included in Station Supplements to section 47.9.

Tables showing volumes of the graded butt logs only, by quality class and by species or species group, may be prepared at the option of the Stations and Regions.

Show quality class data in table 15 by the following species or species groups:

Eastern species or species groups	Western species or species groups
Softwoods:	Douglas-fir
Yellow pines	Ponderosa and Jeffrey pines
Eastern white and red pines	Western white and sugar pines
Spruce and balsam fir	Western hemlock
Other eastern softwoods	True firs
	Redwood
	Spruce
	Other western softwoods
	Western hardwoods
Hardwoods:	
Select white and red oaks (*Q. alba*, *Q. michauxii*, *Q. muehlenbergii*, *Q. durandii*, *Q. bicolor*, *Q. macrocarpa*, *Q. rubra*, *Q. falcata* var. *pagodaefolia*, and *Q. shumardii*)	
Other white and red oaks	
Hickory	
Yellow birch	
Hard maple	
Sweetgum	
Ash, walnut, and black cherry	
Yellow-poplar	
Other hardwoods	

Table 15.--Net volume of sawtimber on commercial forest land, by species and quality classes, (State), 19__

(Million board feet)[1/]

Species	Quality classes	
	All classes	(Specify log or tree grades used)
	(--xxx.x)	----------(--xxx.x)----------
Softwoods:		
(Show applicable species listed above.)		
Total		
Hardwoods:		
(Show applicable species listed above.)		
Total		

1/ International 1/4-inch rule.

FOREST SURVEY HANDBOOK

24 - TIMBER GROWTH AND TIMBER REMOVALS. The components of net annual growth of growing stock are (1) the increment in net volume (after allowances for defect) of trees in the growing stock at the beginning of the specified year and surviving to its end (survivor growth); plus (2) the increment in net volume of trees in the growing stock at the beginning of the year that were cut, died, or became culls during the year; plus (3) the net volume of trees that grew into growing stock during a specified year (ingrowth); minus (4) the net volume of trees in the growing stock that died from natural causes (annual mortality); minus (5) the net volume of trees in the growing stock that became rough or rotten trees during the year.

Estimates of net annual growth should be for a specified survey year, based on average or trend rates of diameter growth and mortality. Diameter growth rates may be determined from increment cores for new plots or from changes in d.b.h. between inventories.

Information on timber removals also should ordinarily be shown for a specified Survey year, but the average removals for a period of years may be used if considered more representative of the trend level of cutting.

Average levels of growth and removals should be determined for the period between successive inventories so that initial inventory plus net growth between surveys minus total removals between surveys equals second inventory. Estimates of growth and removals for a specified survey year should be consistent with the average levels of growth and removals that must have occurred during the period between surveys.

Information on timber growth and timber removals should be shown for growing stock in cubic feet and for sawtimber in board feet. Other tabulations in cords or other units of measure are optional.

FOREST SURVEY HANDBOOK

24.1 - Annual Net Growth and Removals of Growing Stock, by Species

Table 16.--Net annual growth and removals of growing stock on commercial forest land, by species, (State), 19__

(Thousand cubic feet)

Species	Net annual growth	Annual timber removals
Softwoods:		
(Show species or species groups listed in section 23.5.)		
Total		
Hardwoods:		
(Show species or species groups listed in section 23.5.)		
Total		
All species		

24.2 - Annual Net Growth and Removals of Growing Stock, by Ownership Classes

Table 17.--Net annual growth and removals of growing stock on commercial forest land, by ownership classes, and softwoods and hardwoods, (State), 19__

(Thousand cubic feet)

Ownership	Net annual growth			Annual removals		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
National Forest						
Other public						
Forest industry						
Farmer and miscellaneous private						
All ownerships						

24.3 - Annual Net Growth and Removals of Sawtimber, by Species

Table 18.--Net annual growth and removals of sawtimber on commercial forest land, by species, (State), 19__

(Thousand board feet) 1/

Species	Net annual growth	Annual removals
Softwoods:		
(Show species or species groups listed in section 23.5.)		
Total		
Hardwoods:		
(Show species or species groups listed in section 23.5.)		
Total		
All species		

1/ International 1/4-inch rule.

24.4 - Annual Net Growth and Removals of Sawtimber, by Ownership Classes

Table 19.--Net annual growth and removals of sawtimber on commercial forest land, by ownership classes, and softwoods and hardwoods, (State), 19__

(Thousand board feet)[1/]

Ownership	Net annual growth			Annual removals		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
National Forest						
Other public						
Forest industry						
Farmer and miscellaneous private						
All ownerships						

1/ International 1/4-inch rule.

25 - TIMBER MORTALITY ON COMMERCIAL FOREST LAND.

Estimates of annual mortality for a specified survey year should be based upon average or trend rates of loss, computed from dead trees tallied on remeasured plots or during a period of 1, 3, or 5 years immediately prior to field work on new plots. Trend level mortality should include both occasional and unusual or catastrophic losses from fire, insects, etc.

Total mortality should be determined, if feasible, although it is recognized that where dead trees are promptly salvaged field observations may indicate only unsalvaged mortality.

25.1 - Growing Stock and Sawtimber Mortality, by Species

Table 20.--Mortality of growing stock and sawtimber on commercial forest land, by species, (State), 19__

Species	Growing stock (Thousand cubic feet)	Sawtimber (Thousand board feet) 1/
Softwoods:		
(Show species or species groups listed in section 23.5.)		
Total		
Hardwoods:		
(Show species or species groups listed in section 23.5.)		
Total		
All species		

1/ International 1/4-inch rule.

25.2 - Growing Stock and Sawtimber Mortality, by Ownership Classes

Table 21.--Mortality of growing stock and sawtimber on commercial forest land, by ownership classes, and softwoods and hardwoods, (State), 19__

Ownership	Growing stock (Thousand cubic feet)			Sawtimber (Thousand board feet) 1/		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
National Forest						
Other public						
Forest industry						
Farmer and miscellaneous private						
All ownerships						

1/ International 1/4-inch rule.

25.3 - Growing Stock and Sawtimber Mortality, by Causes. Further breakdowns of causes of mortality are desirable, but optional. Thus, losses from specific causes, such as little-leaf disease or southern pine beetle, may be indicated.

Since it is difficult or impossible in many cases to establish a single cause of death, or to identify the primary and secondary causes of death, show combinations of causes, such as fire and insects, when appropriate.

Detailed local criteria for identification of causes of mortality should be developed in cooperation with other research projects.

Table 22.--Mortality of growing stock and sawtimber on commercial forest land, by causes, and softwoods and hardwoods, (State), 19__

Cause	Growing stock (Thousand cubic feet)			Sawtimber (Thousand board feet) 1/		
	All species	Softwoods	Hardwoods	All species	Softwoods	Hardwoods
Fire						
Insects						
Disease						
Other						
Unknown						
All causes						

1/ International 1/4-inch rule.

26 - TIMBER PRODUCTS OUTPUT. Information on production of timber products obtained by the Bureau of the Census should be used when available and suitable. Where census data are inadequate for Forest Survey purposes, cooperative surveys with the Bureau of the Census or other agencies should be developed when feasible. Other sources of information include stump measurements on sample locations and special surveys of wood-using plants or logging operations.

26.1 - Timber Products Output, by Products and Source of Material

Table 23.--Output of timber products, by source of material and softwoods and hardwoods, (State), 19__

Product and species group	Standard units	Total output		Roundwood products		Plant byproducts	
		Number of units	Thousand cu. ft.	Number of units	Thousand cu. ft.	Number of units	Thousand cu. ft.
Saw logs:							
Softwood	M bd. ft. 1/						
Hardwood	M bd. ft. 1/						
Total	M bd. ft. 1/						
Veneer logs and bolts:							
Softwood	M bd. ft. 1/						
Hardwood	M bd. ft. 1/						
Total	M bd. ft. 1/						
Pulpwood:							
Softwood	Std. cords 2/						
Hardwood	Std. cords 2/						
Total	Std. cords 2/						
Cooperage:							
Softwood	M bd. ft. 1/						
Hardwood	M bd. ft. 1/						
Total	M bd. ft. 1/						
Piling:							
Softwood	M linear ft.						
Hardwood	M linear ft.						
Total	M linear ft.						
Poles:							
Softwood	M pieces						
Hardwood	M pieces						
Total	M pieces						
Mine timbers (Round):							
Softwood	M cu. ft.						
Hardwood	M cu. ft.						
Total	M cu. ft.						
Posts (Round and split):							
Softwood	M pieces						
Hardwood	M pieces						
Total	M pieces						
Other 3/:							
Softwood	M cu. ft.						
Hardwood	M cu. ft.						
Total	M cu. ft.						
Total industrial products:							
Softwood							
Hardwood							
Total							
Fuelwood:							
Softwood	Std. cords						
Hardwood	Std. cords						
Total	Std. cords						
All products:							
Softwood							
Hardwood							
Total							

1/ International 1/4-inch rule.
2/ Rough-wood basis (Include chips converted to equivalent standard cords).
3/ Includes hewn ties, excelsior bolts, shingle bolts, turnery bolts, and chemical wood.

26.2 - Roundwood Products Output by Products and Source

Table 24.--Output of roundwood products by source, and softwoods and hardwoods, (State), 19__

(Thousand cubic feet)

Product and species group	All sources	Growing stock trees 1/			Rough and rotten trees 1/	Salvable dead trees 1/	Other sources 2/
		Total	Sawtimber	Poletimber			
Industrial products:							
Saw logs:							
Softwood							
Hardwood							
Total							
Veneer logs and bolts:							
Softwood							
Hardwood							
Total							
Pulpwood:							
Softwood							
Hardwood							
Total							
Miscellaneous industrial products:							
Cooperage:							
Softwood							
Hardwood							
Total							
Piling:							
Softwood							
Hardwood							
Total							
Poles:							
Softwood							
Hardwood							
Total							
Mine timbers (Round):							
Softwood							
Hardwood							
Total							
Posts (Round and split):							
Softwood							
Hardwood							
Total							
Other:							
Softwood							
Hardwood							
Total							
All miscellaneous industrial products:							
Softwood							
Hardwood							
Total							
All industrial products:							
Softwood							
Hardwood							
Total							
Fuelwood:							
Softwood							
Hardwood							
Total							
All products:							
Softwood							
Hardwood							
Total							

1/ On commercial forest land.

2/ Includes trees less than 5.0 inches in diameter, tree tops and limbs from commercial forest areas or material from noncommercial forest land or nonforest land such as fence rows or suburban areas.

26.3 - Growing Stock Timber Removals by Items

Table 25.--Timber removals from growing stock on commercial forest land, by items, and softwoods and hardwoods, (State), 19__

(Thousand cubic feet)

Item	All species	Softwoods	Hardwoods
Roundwood products:			
Saw logs			
Veneer logs and bolts			
Pulpwood			
Cooperage logs and bolts			
Piling			
Poles			
Mine timbers			
Posts			
Other			
Fuelwood			
All products			
Logging residues			
Other removals			
Total removals			

26.4 - Sawtimber Removals by Items

Table 26.--Timber removals from live sawtimber on commercial forest lands, by items, and softwoods and hardwoods, (State), 19__

(Thousand board feet)[1/]

Item	All species	Softwoods	Hardwoods
Roundwood products:			
Saw logs			
Veneer logs and bolts			
Pulpwood			
Cooperage logs and bolts			
Piling			
Poles			
Mine timbers			
Posts			
Other			
Fuelwood			
All products			
Logging residues			
Other removals			
Total removals			

1/ International 1/4-inch rule.

26.5 - Unused Residues Volume by Industry and Type of Residue

Table 27.--Volume of unused residues at primary manufacturing plants, by industry and type of residue, and softwoods and hardwoods, (State), 19__

Species group and type of residues	All industries	Lumber	Veneer and plywood	Other
Softwoods:				
Coarse[1/]				
Fine[2/]				
Total				
Hardwoods:				
Coarse[1/]				
Fine[2/]				
Total				
All species:				
Coarse[1/]				
Fine[2/]				
Total				

1/ Material, such as slabs, edgings, and veneer cores.
2/ Material, such as sawdust and shavings.

Explanation: Determination of volumes of unused plant residues produced in secondary manufacturing industries is optional.

- PROJECTED TIMBER GROWTH AND CUT. Assumptions used making these projections should be clearly stated, including assumed trends in forestry programs and other relevant factors, such as projected land clearing or reversion to forest. Calculations should assume that available cut and growth will be in balance at the end of 30 years.

Table 28.--Projections of net annual growth, available cut and inventory of sawtimber and growing stock on commercial forest land, (State), 19__

ies oup	Growing stock (Thousand cubic feet)				Sawtimber (Thousand board feet)1/			
	19__ (Inventory year)	19__ (Inventory year plus 10 years)	19__ (Inventory year plus 20 years)	19__ (Inventory year plus 30 years)	19__ (Inventory year)	19__ (Inventory year plus 10 years)	19__ (Inventory year plus 20 years)	19__ (Inventory year plus 30 years)
ods:								
wth								
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rnational 1/4-inch rule.

28 - FOREST TYPE MAPS. A generalized forest type map on a scale of 1:2,500,000, or approximately 1 inch equals 40 miles, may be included in each State or subregion Forest Survey report. Any area of at least 100 square miles having 10 percent or more of forest land should be shown; smaller areas may be shown at the Stations' discretion. Narrow stringers of forest, as along river bottoms, may be shown diagrammatically.

Detailed forest type maps, at scales of 1 inch equals 1 mile, for example, ordinarily should not be prepared by the Survey, unless financed wholly or to a major degree by cooperative funds, or unless preparation of detailed type and stand-size class maps is an integral part of an approved Forest Survey plan.

28.1 - Cover Type Groups. Forest cover type groups listed below, or significant local cover types keyed to these groups, shall be used. All type maps should be printed with colors as specified.

Productive forest land reserved for nontimber purposes should be indicated by vertical hatching over type colors.

28.11 - Eastern

Cover type groups	Color	GPO ink number 1/	Crayon number 2/
White-red-jack pine	Brown	173	343
Spruce-fir	Slate grey	189	331-1/2
Longleaf-slash pine	Red (vermillion)	121	349
Loblolly-shortleaf pine	Lemon yellow	133	353-1/2
Oak-pine	Orange	171	324
Oak-hickory	Green	145	354
Oak-gum cypress	Olive green	143	325
Elm-ash-cottonwood	Sky blue	153	320
Maple-beech-birch	Light green	141	354-1/2
Aspen-birch	Blue	152	350

1/ Government Printing Office, Standard Ink Sample Book, 1950.
2/ Dixon "Best" Colored Pencils, Assortment No. 110.

FOREST SURVEY HANDBOOK

28.12 - Western

Cover type groups	Color	GPO ink number 1/	Crayon number 2/
Douglas-fir	Olive green	142	325
Hemlock-Sitka spruce	Green	144	354
Redwood	Bright red	119	321
Ponderosa pine	Lemon yellow	132	353-1/2
White pine	Dark chrome	134	351-1/2
Lodgepole pine	Terra cotta	172	351
Larch	May green	147	356
Fir-spruce	Light green	148	354-1/2
Hardwoods	Azure	194	320-1/2
Chaparral	Grey	185	352-1/2
Pinyon-juniper	Black	--	331

1/ Government Printing Office, Standard Ink Sample Book, 1950.
2/ Dixon "Best" Colored Pencils, Assortment No. 110.